REMARKS/ARGUMENTS

In paragraph 2 of the Office action, the examiner states that the Information Disclosure Statement filed 10/20/2003 did not contain the required legible copy of each non-patent literature publication. In response, copies of the two publications listed on the Information Disclosure Statement filed 10/20/2003 are filed herewith.

Double Patenting

In paragraph 4 of the Office action, claims 1-7, 9, and 12 stand provisionally rejected on the ground of nonstatutory, obviousness-type, double patenting as being unpatentable over claims 1, 4-6, 12, 14-15, and 21 of copending Application No. 10/689,355. In paragraph 7 of the Office action, claims 1-7, 9, and 12 stand provisionally rejected on the ground of nonstatutory, obviousness-type, double patenting as being unpatentable over claims 1, 4-6, 12, 14-15, and 20 of copending Application No. 10/689,336. In paragraph 10 of the Office action, claims 1-7, 9, and 12 stand provisionally rejected on the ground of nonstatutory, obviousness-type, double patenting as being unpatentable over claims 1, 4-6, 11, 13-14, and 20 of copending Application No. 10/689,312. Because all of these rejections are provisional, these rejections will be dealt with when patentable subject matter is indicated.

35 U.S.C. § 101

In paragraphs 13-16 of the Office action, claims 1-12 stand rejected under 35 U.S.C. § 101. Claim 1 is said to be "so broad and sweeping as to preempt substantially every practical application of the idea embodied by the mathematical constructs of the claim." This ground of rejection cannot be sustained. First, claim 1 has been amended to make it clear that the method is being performed on at least a portion of the parallel processing elements making up the processing system. Second, there are a number of ways to determine a local mean value of tasks. Some, however, produce rounding errors. See paragraphs [0044] – [0046] of the published application. Claim 1 is a very specific method of calculating a local mean which requires assigning values of E_r (the specifics of which are discussed below) so that the rounding can be controlled. Thus, contrary to the examiner's assertion that the claim is so broad and sweeping as

to preempt substantially every practical application of the idea embodied by the mathematical constructs of the claim, the claim is limited to calculating local mean values on parallel processing elements using a method in which a unique number E_r is assigned to each PE to control the rounding process. This 35 U.S.C. § 101 ground of rejection should be withdrawn.

Claim 1 is also said to fail to provide a useful, concrete and tangible result because "no clear objective guidance is provided as to how that value [E_r] is assigned." The applicant respectfully disagrees. Paragraph [0049] of the published application provides as follows:

> FIG. 4 illustrates an operational process 60 for an improved rounding function for rounding the local mean value of one or more processing elements within an array according to an embodiment of the present invention. Operational process 60 begins with E_r values being assigned to the PEs in the line in operation 61, where E_r represents a number in the range of 0 to (N −1). In the current embodiment, each PE_r is assigned a different E_r value for controlling the rounding. <u>The simplest form for the function E is the case in which $E_r = P_r$, the number of the PE. For example, for PE_0, $E_0 = 0$; for PE_1, $E_1 = 1$; for PE_2, $E_2 = 2$; etc. (See Table #1 below.)</u> By assigning each PE 30 a different E_r value, the rounding function can be controlled such that some of the local means are rounded up and some of the local means are rounded down, thus insuring that $V = \sum_{i=0}^{i=N-1} M_i$. (emphasis added)

The table referred to in the quote is reproduced below:

PE_r	E_r	$(V+E_r)/N$	$Trunc((V+E_r)/N)$
PE_0	0	5.375	5
PE_1	1	5.5	5
PE_2	2	5.625	5
PE_3	3	5.75	5

In view of the forgoing, the position that "no clear objective guidance is provided as to how that value [E_r] is assigned" cannot be sustained. This 35 U.S.C. § 101 ground of rejection should be withdrawn.

Finally, although not objected to by the examiner, claim 12 has been amended to make it clear that the memory device in question is a "computer readable" memory device.

35 U.S.C. § 112

In paragraph 18ai, the examiner indicates, with respect to claim 5, that it is unclear how E_r "controls" the *Trunc* function. The language of claim 5 has been amended to recite that the truncating step is responsive to the value of E_r. With respect to the examiner's question about how this step is possible, "since each E_r value is set ahead of time and must be different for each processing element," the examiner's attention is respectfully directed to paragraph [0049] reproduced above.

With respect to paragraph 18aii, the examiner states that the recitation of "X and (X+1)" is unclear. The examiner's attention is respectfully directed to paragraph [0014] of the published application which provides as follows:

> The present invention enables local mean calculations to be completed without introducing rounding errors which may, for example, have adverse effects on subsequent load balancing methods related to an array of processing elements. The present invention enables tasks to be distributed within a network of connected PEs so that each PE typically has X number of tasks or (X+1) number of tasks to perform in the next phase. The present invention may be performed using the hardware and software (i.e., the local processing capability) of each PE within the array. Those advantages and benefits, and others, will become apparent from description of the invention below.

The examiner's attention is also directed to the table appearing in paragraph [0054] of the published application which provides:

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PE_r	E_r	$(V+E_r)/N$	$Trunc((V+E_r)/N)$
PE_0	0	5.375	5
PE_1	1	5.5	5
PE_2	2	5.625	5
PE_3	3	5.75	5
PE_4	4	5.875	5
PE_5	5	6	6
PE_6	6	6.125	6
PE_7	7	6.25	6

Table #1 – Local Mean Calculation For $V = 43$, $N = 8$.

The language of claim 6 has been amended to indicate that a local mean for each group is equal to either X, or X+1, as seen clearly from Table No. 1 where X = 5 and X+1 = 6.

35 U.S.C. § 103

In paragraph 20 of the Office action, claims 1-12 stand rejected under 35 U.S.C. § 103 as being obvious in view of Vignes et al. (Patent No. 4,386,413) (hereinafter Vignes). In paragraph 22 of the Office action, the Office recognizes that "Vignes does not teach assigning a value, summing a total number of tasks and said value, and dividing the sum of said total number of tasks present on said parallel processing system and said value by a total number of processing elements." The examiner seeks to augment the teachings of the primary reference with the statement that it is well known in the art that a mean calculation is defined as "the value obtained by dividing the sum of a set of quantities by the number of quantities in the set." It is respectfully submitted that this well-known teaching, as expressed by the examiner, fails to disclose or suggest assigning a number E_r to each of the processing elements for the purpose of controlling rounding errors. Thus, even assuming that the examiner is correct in his assertion, the combination of the well-known method of calculating a mean in combination with Vignes is still missing the step of assigning a value E_r to each of the processing elements. Thus, the

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examiner's assertion that "the skilled artisan would have known to apply a value to the numerator of the arithmetic mean calculation" finds no support in the definition of "mean" set forth in paragraph 23. Because a step of the method recited in claim 21 is missing from the combination of the primary reference and the knowledge of a person of ordinary skill in the art, the combination of the two does not render claim 1 obvious.

In paragraphs 25 and 26 of the Office action, claim 2 stands rejected on the basis of a combination of the primary reference with the knowledge of a person of ordinary skill in the art. The Office, as previously stated, has not demonstrated that a person of ordinary skill in the art would be aware of the need, or usefulness, of assigning a value E_r to each of the processing elements and to use that assigned value in calculating the mean. Thus, it is even less likely that a person of ordinary skill in the art would be aware of assigning a value to E_r equal to a number between zero and (N-1) where N represents the total number of processing elements in the parallel processing system.

In paragraphs 27 and 28 of the Office action, claim 3 stands rejected on the basis of a combination of the primary reference with the knowledge of a person of ordinary skill in the art. The Office has not demonstrated that a person of ordinary skill in the art would be aware of the need, or usefulness, of assigning a value E_r to each of the processing elements and to use that assigned value in calculating the mean. Thus, it is even less likely that a person of ordinary skill in the art would be aware of assigning a unique value to E_r.

In paragraphs 29 and 30 of the Office action, claim 4 stands rejected on the basis of a combination of the primary reference with the knowledge of a person of ordinary skill in the art. The Office has not demonstrated that a person of ordinary skill in the art would be aware of the need, or usefulness, of assigning a value E_r to each of the processing elements and to use that assigned value in calculating the mean. Thus, it is even less likely that a person of ordinary skill in the art would be aware of assigning a value to E_r equal to a number for the selected processing element.

In paragraphs 31 and 32 of the Office action, claim 5 stands rejected on the basis of a combination of the primary reference with the knowledge of a person of ordinary skill in the art. The Office has not demonstrated that a person of ordinary skill in the art would be aware of the

need, or usefulness, of assigning a value E_r to each of the processing elements and to use that assigned value in calculating the mean. Thus, it is even less likely that a person of ordinary skill in the art would be aware of assigning a value to E_r such that a total number of tasks for the processing system equals the sum of the local mean number of tasks for each processing element.

In paragraphs 33 and 34 of the Office action, claim 6 stands rejected on the basis of a combination of the primary reference with the knowledge of a person of ordinary skill in the art. The Office has not demonstrated that a person of ordinary skill in the art would be aware of the need, or usefulness, of assigning a value E_r to each of the processing elements and to use that assigned value in calculating the mean. Thus, it is even less likely that a person of ordinary skill in the art would be aware of assigning a value to E_r equal to a ether X or (X+1).

In paragraph 35 of the Office action, claims 7-11 are rejected in view of Vignes. Claim 7 has been cancelled as the subject matter of claim 7 is now found in amended claim 1. Claims 8-11 have been amended as a matter of style and not in response to the rejection.

It is the examiner's position that even though the primary reference "does not teach that said assigning step, said summing step, said dividing step, and said truncating step are completed on a portion, a line, a loop, an array, or an array of two or more interconnected processing elements within said parallel processing system, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method . . . on various different arrangements of processing elements. One would be motivated by the desire to extend the breadth of the invention." It is respectfully submitted that the examiner has not provided any basis in the prior art or reasonable motivation for concluding that claims 8-11 would have been obvious in view of the primary reference. A motivation to extend the breadth of the invention is not a sufficient rationale to support a rejection under 35 U.S.C. § 103. See Fed. Reg., Vol. 72, No. 195, Section III Rationales to Support Rejections Under 35 U.S.C. 103 (Wednesday, October 10, 2007). In the absence of an acceptable rationale, the rejection of claims 8-11 cannot be sustained.

Claim 12 stands rejected in paragraph 37 of the Office action for the same reasons that claim 1 has been rejected. It is believed that the arguments set forth above with respect to

claim 1 are equally applicable to claim 12 such that claim 12 is now believed to be in condition for allowance.

Request for Interview

Applicant has made a diligent effort to place the instant application in condition for allowance. If the examiner is of the opinion that the instant application is in condition for disposition with respect to the art currently of record other than through allowance, the examiner is respectfully requested to contact applicant's attorney at the telephone number listed below **so that an interview may be scheduled before the issuance a final Office action rejecting the claims**.

Respectfully submitted,

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